

Docket: 204/505 US
Applic.: 10/590,180

Claims List

- 1
2 1. (Currently Amended) An apparatus for free motion stitching and for
3 inserting stitches of uniform length through a stack of one or more fabric layers as said
4 stack is manually guided in a substantially horizontal plane, said apparatus comprising:
5 a fixedly located stitch head including a needle mounted for cyclic vertical
6 movement;
7 a bed defining a substantially horizontally oriented first planar surface
8 mounted opposite to said stitch head;
9 a frame configured to retain a said fabric layer stack in a substantially taut
10 condition adjacent to said first planar surface;
11 ~~means at least one bearing~~ supporting said frame for manually guided
12 movement to move said stack across said first planar surface;
13 a detector for producing one or more signals representing the magnitude of
14 translational movement of said frame; and
15 control ~~means circuitry~~ responsive to said detector signals indicating a
16 magnitude of translational movement exceeding a threshold magnitude for causing said
17 needle to execute a cyclic movement from an up position remote from said stack, to a
18 down position piercing said stack, and back to said up position.
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20 2. (Cancelled)
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22 3. (Currently Amended) The apparatus of claim 2-1 wherein said bearings
23 comprise wheels.
24 4. (Currently Amended) The apparatus of claim 2-1 wherein said bearings
25 comprise slide members.
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1 5. (Currently Amended) The apparatus of claim 2_1 wherein said detector
2 is coupled to said frame for movement therewith.

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4 6. (Original) The apparatus of claim 5 wherein said detector comprises an
5 optical detector responsive to light reflected from said second planar surface.

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7 7. (Currently Amended) The apparatus of claim 2_1 wherein said detector
8 comprises at least one arm linked to said frame for movement therewith and means
9 responsive to movement of said arm for producing said signals.

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1 8. (Currently Amended) A method of forming successive stitches of
2 uniform length while free motion stitching through a stack of fabric layers, said method
3 comprising:

4 mounting an actuatable stitch head at a fixed location above a planar
5 surface;

6 mounting a stack of fabric layers to a frame;

7 manually moving said frame to guide said stack across said planar surface;

8 detecting the movement of said frame; and

9 actuating said stitch head in response to a magnitude of frame movement
10 greater than a threshold magnitude to cause a needle in said stitch head to move from an
11 up position remote from said stack, to a down position piercing said stack, and back to
12 said up position

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14 9. (Original) The method of claim 8 wherein stitch head is actuated at a rate
15 proportional to the rate of translational movement of said frame.

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1 10. (Currently Amended) A method of forming successive stitches of
2 uniform length while free motion stitching through a stack of fabric layers, said method
3 comprising:
4 mounting an actuatable stitch head at a fixed location above a planar
5 surface;
6 mounting a stack of fabric layers to a frame;
7 manually moving said frame to guide said stack across said planar surface;
8 detecting the movement of said frame; and
9 controlling said stitch head to cause a needle to execute cyclic movements
10 at a rate proportional to the speed of movement of said frame.

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11. (Currently Amended) An apparatus for free motion stitching and for
inserting stitches of uniform length through a stack of one or more fabric layers as said
stack is manually guided in a substantially horizontal plane, said apparatus comprising:

a fixedly located stitch head including a needle mounted for cyclic vertical
movement;

a bed defining a substantially horizontally oriented first planar surface
mounted opposite to said stitch head;

a frame configured to retain a said fabric layer stack in a substantially taut
condition adjacent to said first planar surface;

~~means at least one bearing~~ supporting said frame for manually guided
movement across a substantially horizontally oriented second planar surface to move said
stack across said first planar surface;

a detector for measuring the movement of said frame across said second
planar surface; and

control ~~means circuitry~~ for causing said needle to execute cyclic movements
at a rate substantially proportional to the rate of frame movement measured by said
detector.

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12. (Original) Apparatus for use in combination with a sewing machine which includes a drive subsystem configured to cycle a needle through a path of vertical movement from an up position to a down position and back to said up position, said apparatus comprising:

a frame;

means for removably securing a stack of one or more fabric layers to said frame;

bearing means mounting said frame for hand guided movement across a planar surface;

detector means for producing signals representing the magnitude of translational movement of said frame across said planar surface; and

means for coupling said signals to said drive subsystem to synchronize the cycle rate of said needle to the translational movement of said frame.

13. (Original) The apparatus of claim 12 wherein said bearing means comprises at least one wheel.

14. (Original) The apparatus of claim 12 wherein said detector means produces signals representing the magnitude of frame translation along first and second perpendicular directions.

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1 15. (Original) The apparatus of claim 12 wherein
2 said means for coupling is adapted to apply said signals to said drive
3 subsystem to initiate a needle cycle in response to frame translation exceeding a
4 threshold magnitude.

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6 16. (Original) The apparatus of claim 12 wherein said drive subsystem
7 includes speed control circuitry; and wherein
8 said means for coupling is adapted to apply said signals to said speed
9 control circuitry.

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